84
87-13

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE RO

COPY

REPLY TO: 3420

DATE: AUG 19 1987

PSW FOREST AND RANGE EXPERIMENT STATION
JAN 06 1988
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SUBJECT: Biological Evaluation of Heart Bar Campground, San Gorgonio Ranger District (Report No. 87-13)

TO: Forest Supervisor, San Bernardino NF

Heart Bar Campground was evaluated by Forest Pest Management (FPM) and Forest personnel in June, 1987. Those present included: SO - Heber Williams; San Gorgonio Ranger District - John Palermo and Gerard Ludikhuize; RO/FPM - John Pronos, Gregg DeNitto, and John Dale. The purpose of the visit was to assess pest conditions on the site in relation to plans for redesigning the campground.

Previous visits to Heart Bar Campground in 1979 and 1980 by FPM documented two major diseases - western dwarf mistletoe on Jeffrey pine and Fomes annosus root disease on conifers. These findings were summarized in memos sent to the Forest Supervisor (3430, Dec. 17, 1979 and 3430, Sept. 4, 1980). The second report included a campground map that identified root disease center locations.

Root disease

Many portions of Heart Bar Campground have very sparse vegetation, and Jeffrey pine is the only tree species present. The primary impact of annosus root disease is the death of pines of all ages, which creates openings in the stand. Because the fungus remains viable in the roots of killed trees, disease centers cannot be propagated with conifers for decades. Pines with root disease are not usually hazardous, from a tree failure perspective, because they die quickly and are promptly removed.

All proposed new roads, which includes Loops A-D, and campsite locations were examined. When Forest and District personnel layed out the new campground design, they placed roads and campsite spurs in existing openings whenever possible. This was done to minimize the need for removing living trees during construction. In most cases, existing openings in Heart Bar have been created by root disease. Utilizing these openings may be fine for the short-term, but in the future, root disease may kill more trees and enlarge the size of openings. As additional trees die, the amount of available shade is reduced, which may have a significant effect on campsites located within or near root disease centers. The rate of spread of Fomes annosus is unpredictable; some of the disease centers identified in 1979/80 have not enlarged during the past 7 years.

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New root disease centers that were identified during this examination have been drawn on an overlay map of the campground. Most of these are probably expanded portions of old centers; others are outside the area surveyed in 1979/80. Locations of disease centers on the maps are very approximate, and may not be of great value for additional campground design. The number and distribution of root disease centers has had, and will continue to have, a major impact on the pine component in Heart Bar, even though some centers are small and others appear currently inactive.

Three alternatives are available that address the root disease situation and campground layout:

1) The proposed layout could be implemented and future mortality accepted. Construction of new roads and spurs may "eradicate" some root disease if a row of living pines is removed from the periphery of a center. Mortality may continue around the edges of some larger centers which would alter the characteristics of campsites.

2) The proposed layout could be implemented with movement of some campsites to avoid root disease centers. This would reduce the amount of mortality in the immediate vicinity of the sites and result in fewer changes in their desirable characteristics. Additional field work to make the changes would be necessary, but major alterations would not be required. This action would involve the removal of additional trees during construction.

3) The proposed layout could be changed so that roads and camping spurs avoid root disease centers as much as possible. Because of the number and size of the disease centers, major changes in the proposed layout would be required. Loops A,C, and D could remain gennerally in their present locations, with some modification. Loop B would need to be changed significantly due to the amount of root disease present. It may not be possible to keep Loop B in its present location. Mortality in and around campsites and along roads would be reduced. Openings in the stand would still be common between sites, however.

Root disease has been very active on the western edge of the campground, where group campsites are proposed. Perhaps a different area with less root disease and more trees can be found and used for these sites.

Dwarf Mistletoe

The considerable dwarf mistletoe infestation identified in 1979 has been significantly eliminated through a primary suppression effort in 1981 and several later small-scale entries. Mistletoe is still present in the campground, including on Loop C in the expansion area. Its location has been marked on the attached map overlay. The mistletoe in, and west, of Loop D was not treated during the original control project (reason unknown), although some of this is probably from latent infections not visible in 1981.

The infestation in the northern part of Loop C was not included in the 1981 control effort. This area is not large, but almost all of the pines are severely infected. Unfortunately, this stand is comprised primarily of pole-size trees, with virtually no overstory present. The best approach is to treat the mistletoe before campground construction is completed.

Three options are available to deal with the dwarf mistletoe situation on Loop C:

(1) The proposed layout could be followed and the mistletoe ignored. Locating the road as proposed and not treating the mistletoe situation would result in annual chronic mortality, with periodic increases in the amount of mortality, especially following drought conditions. Dwarf mistletoe would spread and intensify in the area and cause additional stress to the trees.

(2) The road could be relocated to avoid the mistletoe pocket. The upper section of Loop C could be moved approximately 100 feet to the south. In this event, the only trees that would have to be removed would be those that are impacted by campground development. Residual trees would not be affected by dwarf mistletoe since it is not present in this area.

(3) Efforts can be taken to reduce the level and effects of dwarf mistletoe, while maintaining the proposed location of the road. A suppression project would need to be implemented after the final road, campsite, and facilities layout was established on the ground. Treatments would include tree felling and broom pruning. Trees with mistletoe intensity ratings of 5 and 6 would have to be removed. Witches' brooms could be pruned from trees with lower ratings. This option would reduce future mortality in the area, but would require the removal of an unknown number of trees. Small changes in campsite locations could take advantage of openings created by tree removals in pockets of heavy mistletoe infection. These openings do not have the potential to enlarge as root disease centers do, assuming that much of the dwarf mistletoe has been eliminated.

Suppression funds for FY 1988 may be available through FPM. We suggest that all of the existing dwarf mistletoe in Heart Bar be treated in one new project. This report will serve as a biological evaluation to justify a project proposal (FS 3400-2 enclosed). Other required documentation includes a project work plan and an economic evaluation. The work plan should describe what treatment methods will be done, how many trees will be treated with each method, how the work will be done (contract vs. force account), and when the work will be completed. The original economic analysis for dwarf mistletoe control at Heart Bar is now 6 years old and no longer valid. Current FSM guidelines for economic evaluations and an example are provided.

It is very important for the District to have clear and agreed upon objectives concerning the desired character of vegetation at Heart Bar before any dwarf mistletoe control work is begun. For example, the infestation in loop "C" is severe, and if biological/pathological guidelines are strictly adhered to, many trees may need to be removed. The result of aggressive mistletoe control on the campground vegetation may be unacceptable. Each infested tree should be rated for mistletoe, after which a decision on treatment can be made. A data form for this procedure is enclosed.

Additional Observations

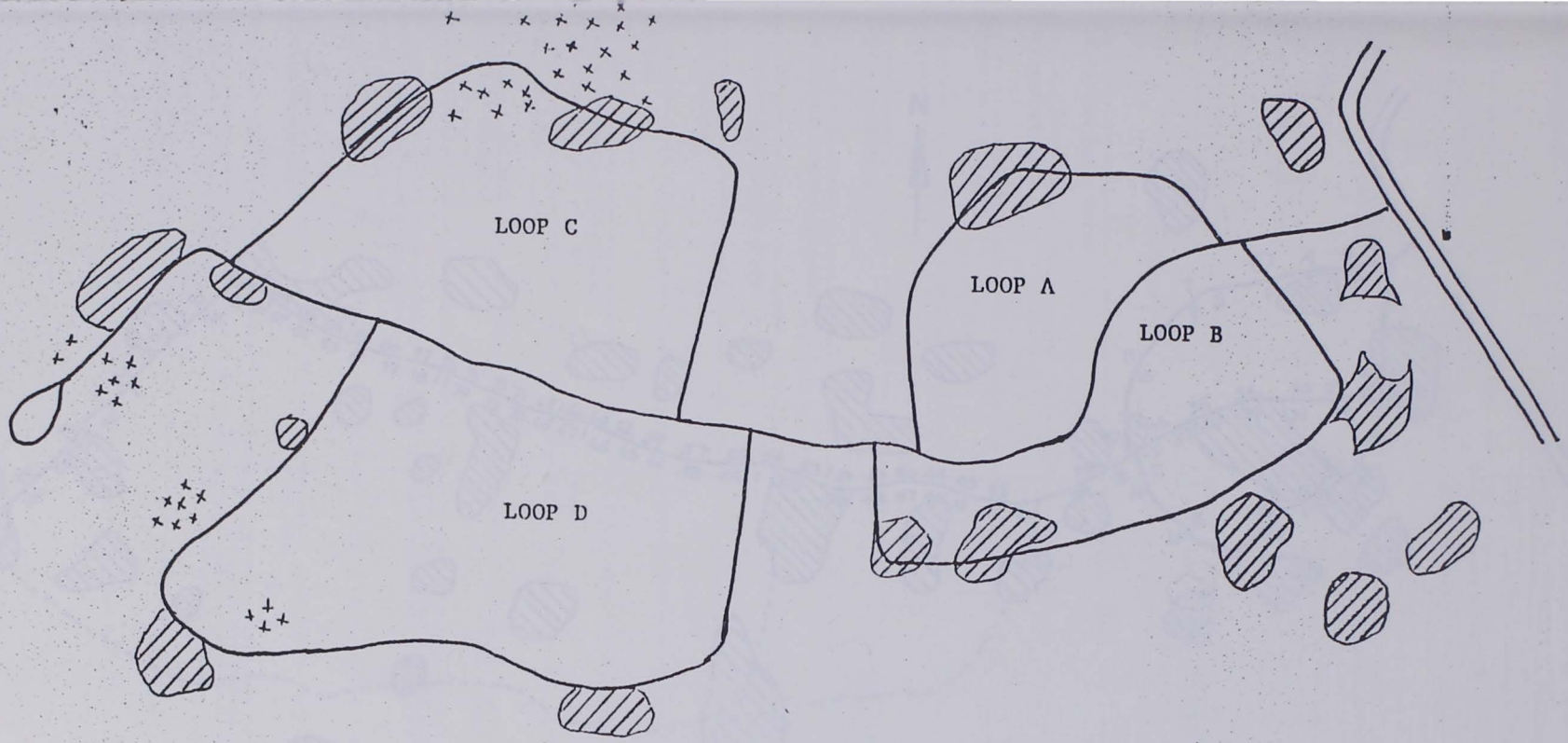
Many portions of new loop roads, drive-throughs, and parking spurs are located close to old overstory pines. It would be preferable to keep paved roads and heavy equipment 20-30 feet away from overstory trees. This is not always possible, and some damage from construction will occur. Damage could be minimized if contractors and equipment operators are made aware of the impact their machinery has on the vegetation. Another approach to consider includes adding contract provisions that penalize the contractor for avoidable damage to high value trees.

Tree damage from construction is not always visible and above-ground, but may occur through soil compaction and root injury. The result, especially during years of low precipitation, is increased susceptibility of high value old pines to successful bark beetle attacks. Protective chemical sprays are registered for these situations but must be applied just prior to or immediately after construction in order for them to be effective. FPM entomologists can provide additional help if such problems are anticipated.

If you require more specific information or have questions please contact John Pronos at (415) 556-6864. If the District plans to submit a project proposal for dwarf mistletoe suppression, we suggest that they send it to FPM as soon as possible.

JOHN NEISESS
FPM Program Leader
State and Private Forestry

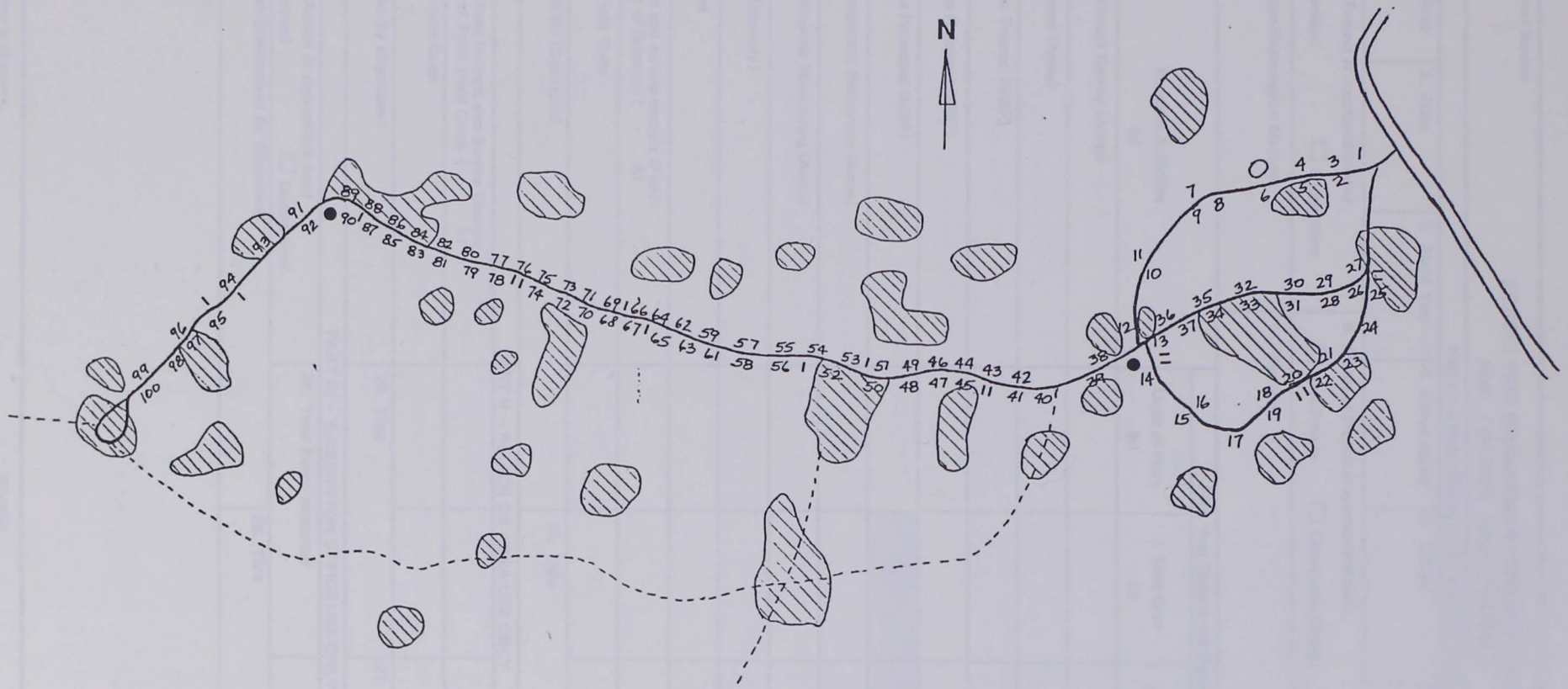
Enclosures



1987 PROPOSED REDESIGN OF
HEART BAR CAMPGROUND

Annosus root diseases centers, 1987

Dwarf mistletoe



HEART BAR CAMPGROUND - SAN BERNARDINO NATIONAL FOREST

= FOMES ANNOSUS DISEASE CENTER

August, 1980

SDA - Forest Service

FOREST PEST MANAGEMENT PROJECT PROPOSAL

(Ref: FSM 3400, Report FS-3400-E)

PART I – REQUESTING OFFICE USE ONLY

1. Region/Area	2. State	3. Fiscal Year	4. Causal Agent	5. Group	6. Landownership *(x appropriate box)* ☐ National Forest ☐ Other Federal

7. Type of Project *(x appropriate box)* ☐ Prevention ☐ Suppression	8. Status of Project *(x appropriate box)* ☐ New Project ☐ Continuing Project	9. Host Protected

10. Prevention/Suppression Method	11. Pesticide	12. Application Rate

Program Activities (a)	First Year Targets and Costs: Units of Work (b)	Unit Cost (c)	Total Planned Cost (d)	Funds Needed in Subsequent Years: FY: Estimated Cost (e)	FY: Estimated Cost (f)
13. Pretreatment Survey (Acres)					
Treatment (Acres)					
Volume Treated (MBF)					
Volume Removed (MBF)					
Volume Protected (MBF)					
Post-Treatment Evaluation (Acres)					
Environmental Monitoring (Acres)					
Other (Identify)					
Subtotal					
Indirect and service charges (Field) Percent of Subtotal (%)					
Total Field Costs					

14. Proposed By *(Signature)*	15. Title	16. Date

PART II – REGION OR AREA USE ONLY

17. Region/Area Indirect and Service Charges Percent of Total Field Costs (%)					
18. Total Project Costs					

19. Approved By *(Signature)*	20. Title	21. Project Number	22. Date

PART III – WASHINGTON OFFICE USE ONLY

23. Project Action *(x appropriate box)* ☐ Approved ☐ Disapproved	24. Total Funds Allocated			

25. Approved/Disapproved By *(Signature)*	26. Title	27. Date

28. Remarks

FOREST PEST MANAGEMENT HANDBOOK

CHAPTER 20 - ECONOMIC EVALUATION

20.3 - Policy. Apply the standards and procedures of this chapter, in conjunction with policy guidelines in FSM 1970 and economic efficiency analysis instructions in chapter 10 of FSH 1909.17.

21 - ALTERNATIVES. When making an economic evaluation of a proposed pest control project, first specify the alternatives to be analyzed. There should always be a "no action" alternative and at least one "control" alternative.

22 - SCENARIOS. For each alternative, devise a scenario, which is an account of the events that have already taken place and of those events that are expected to occur over time. A scenario is the foundation for an economic analysis of a control project.

Examples of information contained in a scenario include:

1. Description of resource(s) that are currently affected by a pest or pest complex and those that could potentially be affected under each alternative.

2. Extent of the existing outbreak and projections of further spread under each alternative.

3. Alternative pest management tactics.

23 - EVALUATION COMPONENTS. Each economic evaluation shall address the costs and revenues that are associated with the alternatives being considered and shall address one or more decision criteria for each alternative.

23.1 - Calculation of Decision Standards. Although the calculation of economic decision standards such as benefit-cost ratio and rate of return is encouraged, the primary factor to calculate in an economic efficiency evaluation is the present net value (PNV). Present net value is the discounted benefits less discounted costs associated with providing all outputs to which monetary values can be assigned for each alternative.

23.2 - Costs. When calculating the cost of each alternative, include all costs necessary to accomplish the objectives of the alternative, regardless of who pays. These costs include, but are not limited to, personnel and materials. However, do not include costs that occurred in the past when calculating the cost of each alternative. Discount future costs to their present values. See FSH 1909.17, section 15.4 for a discussion on methods and standards for discounting.

23.3 - Benefits. Benefits of pest control projects are defined as the difference in present net value (PNV) between a control alternative and the no action alternative. This difference represents the net change in PNV that results from the control effort. The net change may be positive or negative: a positive net change represents losses averted by the control effort; a negative net change indicates that the no action alternative is economically more efficient than the control effort.

24 - EVALUATION OF RESOURCE IMPACTS. A scenario states which resources are affected by a pest, in what ways they are affected, and when the effects would be realized. Define these physical impacts in terms of resource outputs, such as cubic feet of timber, animal unit months, and recreation visitor days, and then express them in monetary terms. Describe, in narrative form, those impacts that cannot be expressed in monetary terms. Types of resource impact valuations include timber, market resources other than timber, nonmarket resources, and incommensurables/intangibles.

24.1 - Timber Impact. Pest outbreaks on timber-producing lands generally cause such undesirable effects as dead trees, growth loss, and disrupted timber management schedules. The economic evaluation determines how a pest outbreak affects the output of timber over time and how a pest management project can alter this effect. While circumstances vary according to the geographic area, the pest involved, the timber products affected, and the management practices, the timber impact evaluation generally includes the following for each area under consideration:

1. Description of management intentions, including scheduled thinnings and harvests. On National Forests, use the existing forest plan to describe management intentions; on other lands, describe the "most likely" management rather than the "ideal" management.

2. Projections of volume yields at future harvests for each alternative (base on management intentions).

3. Projections of value of future harvests for each alternative.

4. Estimates of future costs of harvesting and replanting, if application.

5. Estimates of future pest management costs, if applicable.

6. Discounted values of all costs and revenues for each alternative.

7. Calculation of economic decision standards. Present net value must be calculated; benefit-cost ratio and rate of return may also be calculated.

24.2 - Market Resources Other Than Timber. Value similarly those forest resources, such as range, that exhibit characteristics similar to those of timber. The price of forage, for example, like the price of stumpage, is determined by market transactions.

24.3 - Nonmarket Resources. Market transactions may not be applicable to some resources, such as wildlife or some types of recreation. Use the resource values presented in the most recent Resource Program and Assessment (RPA)--unless there is sufficient reason, fully documented, to do otherwise. If RPA values are not used, select a valuation methodology that most accurately portrays the situation being analyzed.

24.4 - Incommensurables or Intangibles. Incommensurables are items that can be expressed in physical terms, yet are difficult to evaluate monetarily. Examples of incommensurables include changes in the number of persons employed in a local area, changes in wildlife populations, and changes in sediment flow. Intangibles are items that are difficult to express in either physical or monetary terms. Examples of intangibles include changes in air quality and changes in scenic vistas. If incommensurables or intangibles are important considerations for the decisionmaker, include them in narrative form.

25 - OTHER CONSIDERATIONS. Other items to consider during an economic evaluation include:

1. Discount Rate. Discount all future costs and benefits to their present values. See FSM 1971.21 for appropriate discount rates.

2. Sensitivity Analysis. Perform a sensitivity analysis as needed to compare the consequences of varying the level of one or several analysis input factors while holding all other factors constant. The sensitivity analysis can determine how a specific outcome will be affected by a change in the value of an input variable. This can provide insight into the probable outcomes when the input variable(s) are known to have a range of possible values. Clearly discuss implications of sensitivity analysis results.

3. Assumptions and Shortcomings. Explicitly state all assumptions pertinent to the outcome of the evaluation. Also discuss the shortcomings and strengths of the analysis.

4. Price Projections. Express all monetary values (costs and revenues) in real dollars--that is, the purchasing power of the dollar at the time of analysis. Real dollars are sometimes referred to as constant dollars. Do not make projections about the general price level over time. However, assess the real price change of a commodity if the price of the commodity is expected to change relative to all other goods and services during the analysis period. See FSH 1909.17, section 13.5 for further discussion of price projections.

Economic [illegible]
Campground, Lake Tahoe Basin Management Unit ≈ 1984

Economic Comparison of Alternatives

The following economic comparisons of alternatives will look at estimated lost revenues over the next 80 years for each alternative.

In 1983, fee receipts for the campground and beach totaled slightly under $60,000. 1984 revenues are projected to exceed those of 1983 due to rate increases. Occupancy of the campground is 100% from Memorial Day to Labor Day and use of the beach often exceeds capacity. Due to the location of the recreation area in relationship to urban areas, casinos and Lake Tahoe, visitor days are not expected to be impacted as greatly by the alternatives as a recreation area located outside the Basin.

The reduction in visitor days used in the economic comparisons was surmized by Don Lane, Assistant Recreation Staff Officer, LTBMU.

Mortalities, treatments and costs are based on predicted dwarf mistletoe-related mortality and ratings. Predictions of mistletoe ratings and related mortalities are found in Appendix G and are based on Nevada Beach survey results. 1/ The Nevada Beach survey area represents approximately 30 acres of the project area total of 80 acres.

It is expected that 50% of the trees surveyed will have died from mistletoe infections in 66 years (year 2050).

Aesthetic and recreation values were not evaluated in this economic comparison as they are considered to be unquantifiable.

1/ Vogler, Detlev R. and Scharpf, Robert F.
Dwarf Mistletoe-Related Mortality of Ponderosa and Jeffrey Pines at Five Campgrounds in California and Nevada, Forest Pest Management, Forest Service, USDA, Pacific Southwest Region, 1981.

Alternative 1
Do Nothing

Description	Cost	4% Present Worth	Year	Description	Revenue	4% Presen Worth
Remove 15 dead trees @$60/tree	$ 900	$ 900	1984		$60,000	$60,00
Remove 89 dead trees	$ 5,340	$ 3,608	1994	2% reduction in VD	58,800	39,72
Remove 104 dead trees	6,240	2,848	2004	4% reduction in VD	57,600	26,28
Remove 112 dead trees	6,720	2,072	2014	8% reduction in VD	55,200	17,01
Remove 119 dead trees	7,140	1,487	2024	12% reduction in VD	52,800	10,99
Remove 116 dead trees	6,960	979	2034	16% reduction in VD	50,400	7,09
Remove 109 dead trees	6,540	622	2044	20% reduction in VD	48,000	4,56
Remove 98 dead trees	5,880	378	2054	25% reduction in VD	45,000	2,89
Regenerate Campground 30 Acres @$2,000/acre	60,000	3,705				
Remove 86 dead trees	5,160	224	2064	25% reduction in VD	45,000	1,95

Total present worth cost $16,823

Total present worth benefit $170,525

Benefit/Cost Ratio
170,525/16,823 = 10

Alternative 2
Broom and Branch Prune

Description	Cost	4% Present Worth	Year	Description	Revenue	4% Present Worth
21 days pruning with one crew @$180/day	$ 3,780	$ 3,780	1984	No reduction in VD	$60,000	$60,000
30 days pruning with one crew @$180/day	5,400	5,192	1985		60,000	$57,692
Remove 22 dead trees & prune 26 $60/tree for removal & $50/tree to prune	2,620	1,770	1994	No reduction in VD	60,000	40,534
Remove 20 dead trees & prune 23	2,350	1,073	2004	1% reduction in VD	59,400	27,109
Remove 17 dead trees & prune 21	2,070	638	2014		59,400	18,314
Remove 6 dead trees & prune 19	1,310	273	2024	3% reduction in VD	58,200	12,122
Remove 7 dead trees & prune 16	1,220	172	2034	2% reduction in VD	58,800	8,271
Remove 13 dead trees & prune 15	1,530	145	2044		58,800	5,590
Remove 16 dead trees & prune 13	1,610	103	2054	1% reduction in VD	59,400	2,577
Remove 14 dead trees &	1,390	60	2064	1% reduction in VD	59,400	3,815

Total present worth cost $13,207

Total present worth benefit $236,027

Benefit/Cost ratio
178,335/13,207= 18

Alternative 3
Intensive Suppression

Description	Cost	4% Present Worth	Year	Description	Revenue	4% Present Worth
1 crew for 70 days @ 180/day	$12,600	$12,600	1984		$60,000	$60,000
1 crew for 60 days	10,800	10,385	1985	No reduction in VD	60,000	57,692
1 crew for 50 days	9,000	8,321	1986		60,000	55,473
1 crew for 50 days	9,000	8,001	1987		60,000	53,340
1 crew for 50 days	9,000	7,693	1988		60,000	51,288
Post treatment evaluation	1,500	1,140	1991		60,000	45,595
	0	0	1994		60,000	40,534
	0	0	2004		60,000	27,383
	0	0	2014		60,000	18,499
	0	0	2024		60,000	12,497
	0	0	2034		60,000	8,443
	0	0	2044		60,000	5,704
	0	0	2054		60,000	3,853
	0	0	2064		60,000	2,603

Total present worth cost $48,140

Total present worth benefit $442,904

Benefit/Cost ratio
442,904/48,140 = 9

DWARF MISTLETOE SURVEY DATA SHEET

Crew: A_____ Date: A____

Name of Unit/Area _____

B_____ B.____

			A. PRE-SUPPRESSION				B. POST-SUPPRESSION			
Tree No.	DBH	Species	% Live Crown	Hawksworth Rating[1]	Est. % Live Crown after Pruning	Action[2]	Hawksworth Rating[1]	% Live Crown	Photo P	
									Bear.	D

[1]Enter rating for each one-third of crown from bottom to top, plus total score, e.g. 2+1+0 = 3

[2]Enter code for the following actions: L = Leave tree (no action)
R = Remove tree
P = Branch prune
B = Broom prune